CCS Technical Documentation
RH-27 Series Transceivers

Troubleshooting - GPS

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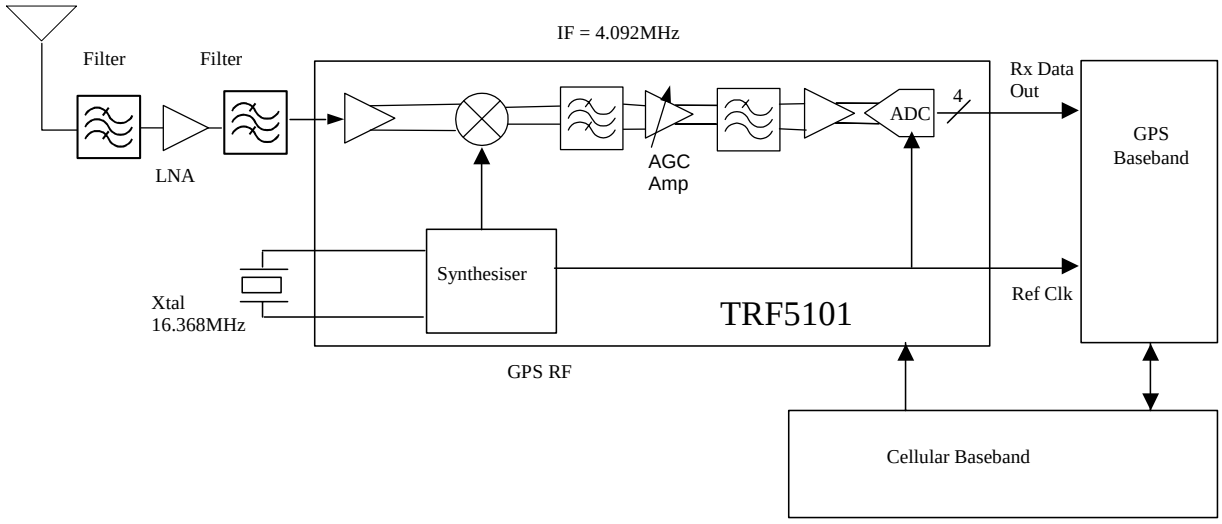
Troubleshooting – Global Positioning System (GPS) Engine

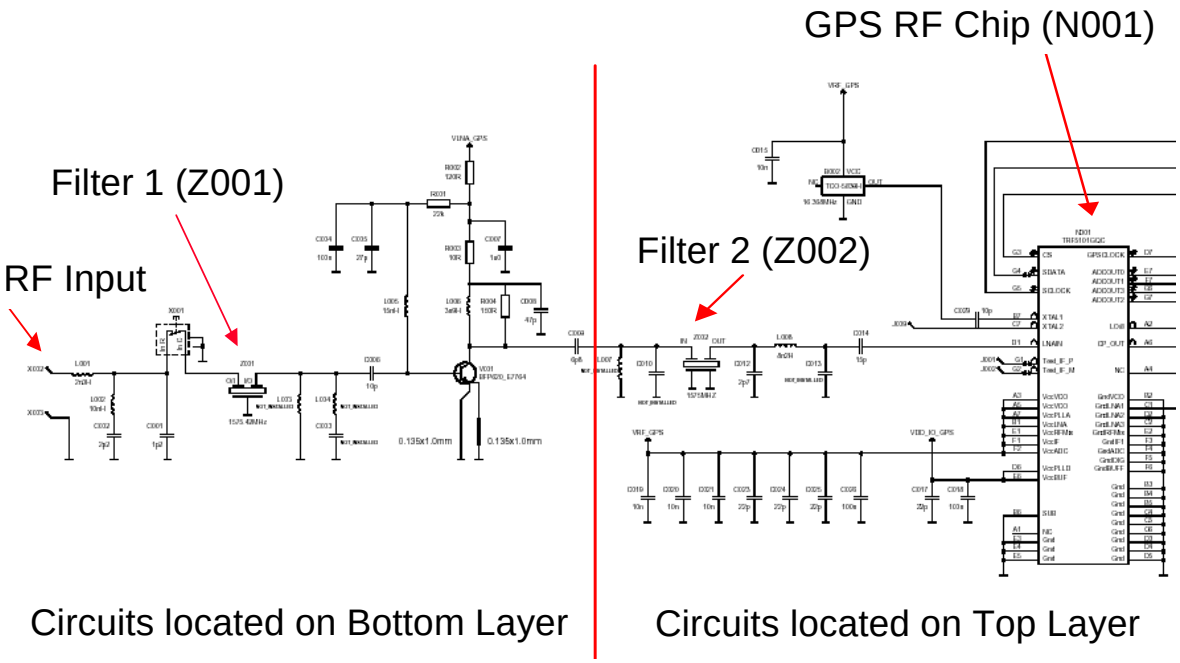
The RH-27 handset supports 800 Amps and 800 CDMA / 1900 CDMA + GPS with IS 2000 capability. The RH-27 engine supports CDMA and GPS functionality for Enhanced 911 (E911) services.

GPS circuitry utilizes RF signals from satellites stationed in geosynchronous orbit to determine latitude and longitude of the handset. The GPS circuitry and the cellular engine (CE) circuitry are completely separate in the handset. The GPS circuitry is located almost exclusively on the secondary side of the PWB, underneath the display module.

GPS General Block Diagram



GPS RF Schematic



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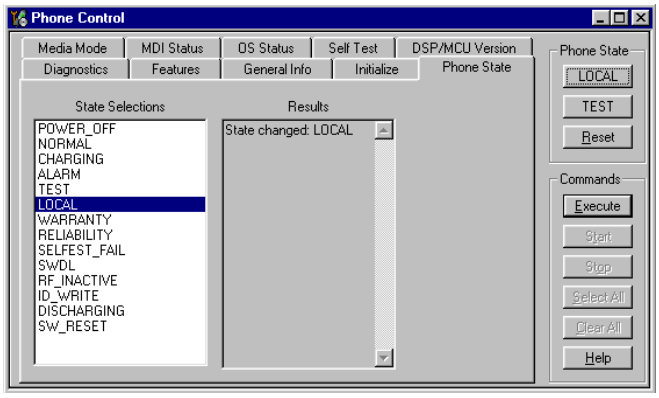
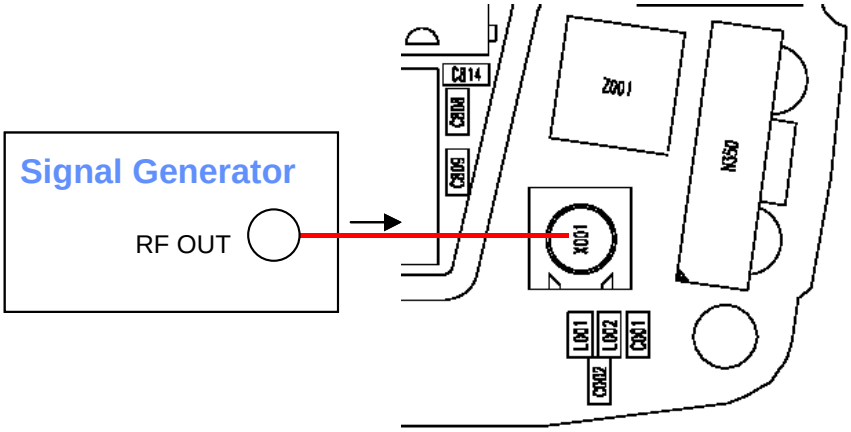
GPS Testing

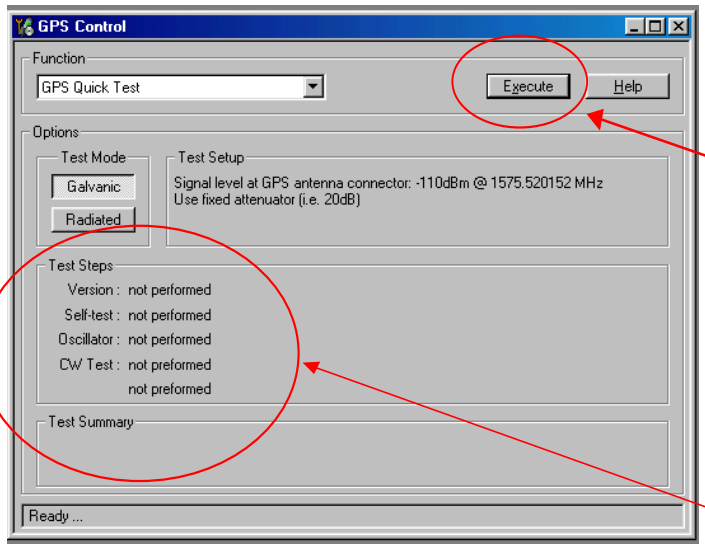
1 Set Local Mode.



2 Inject -110dBm tone @ 1575.52MHz at GPS connector (X001) with signal generator or call box.



3 Open "GPS Control" from the "BB/Hwd" drop-down menu.



4. Execute the GPS Quick Test.

5. Analyze Results: *See next figures*.

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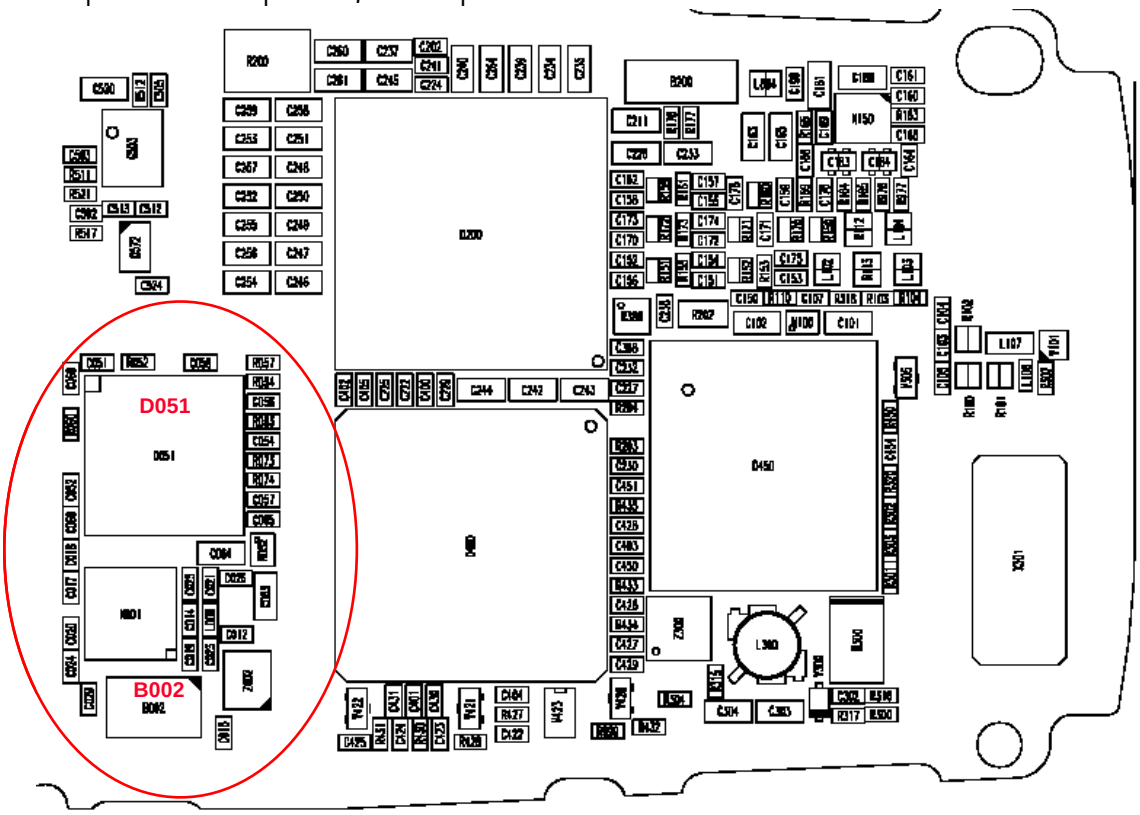
5a. Self-Test Failure:

- Repeat Steps 1-5 for first failure. If the test still fails, continue.
- Inspect all GPS circuit elements around D051.
- If pass visual inspection, then replace D051.

5b. Oscillator Failure:

- Inspect all GPS circuit elements around D051.
- If pass visual inspection, then replace B002.



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5c. CW Test Failure:

- Check that signal generator is on and sourcing a signal to the GPS RF input port (X001).
- Inspect all GPS RF circuit elements.
- Inspect all GPS circuit elements around D051.
- If all visual inspection looks good, then replace GPS RF IC (N001).

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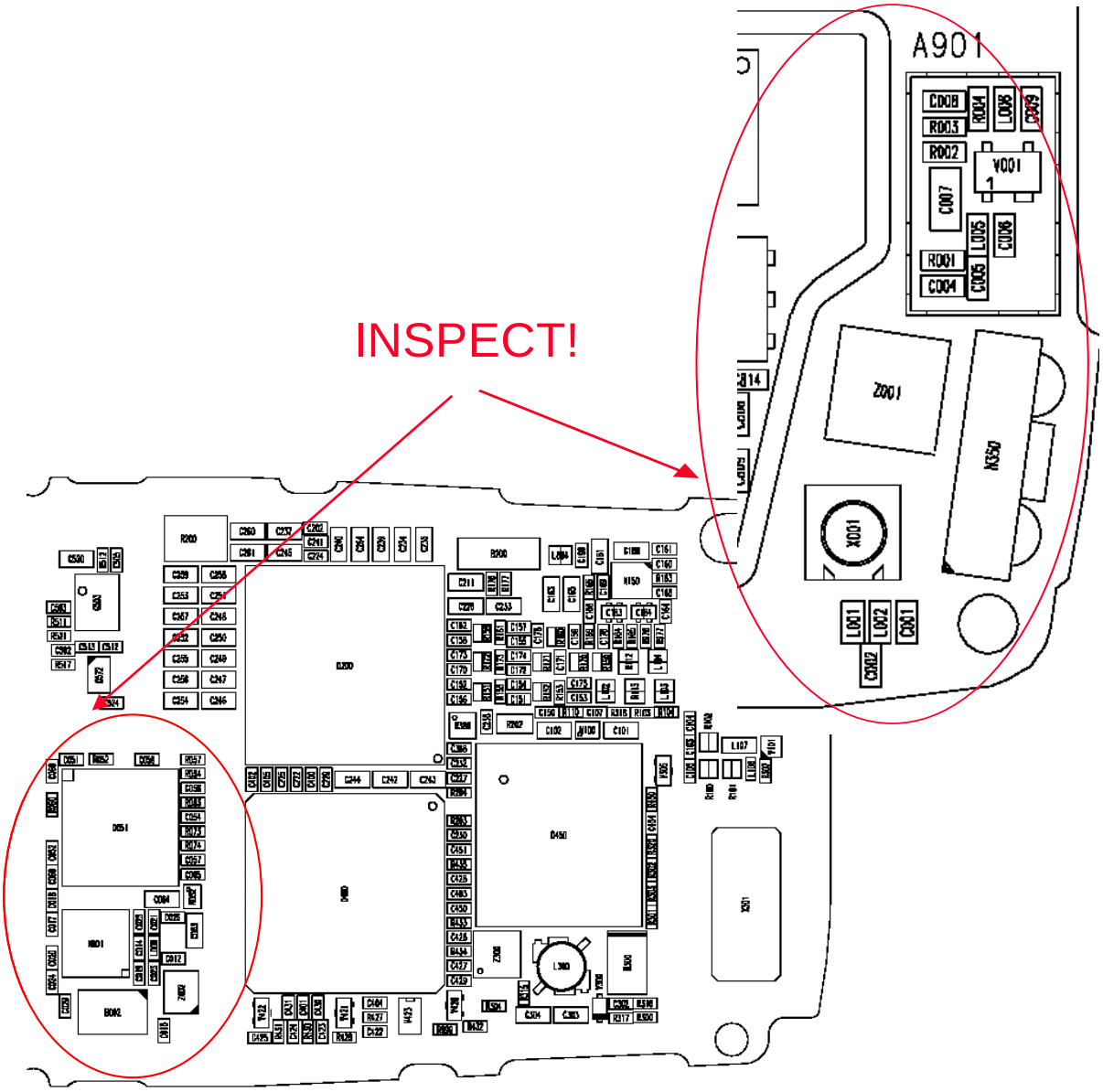

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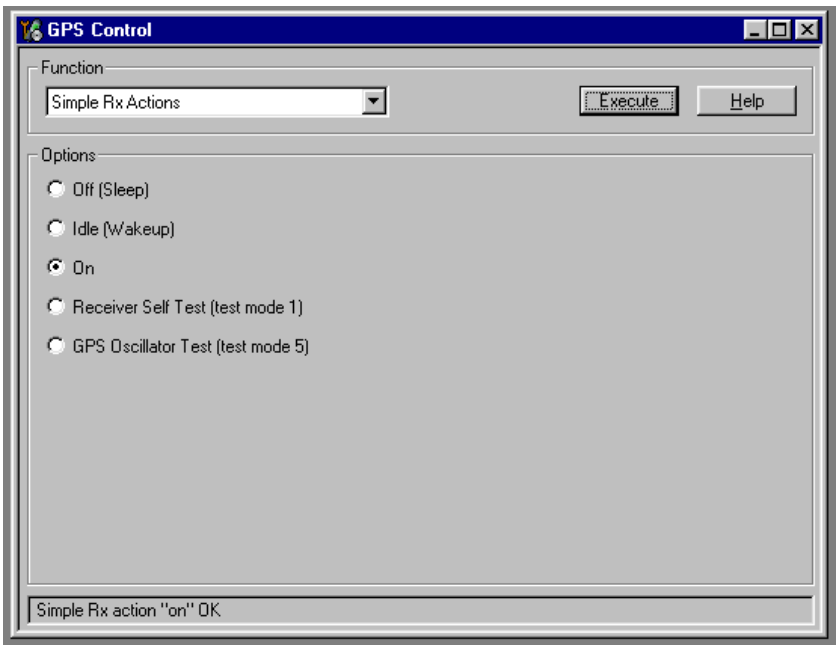
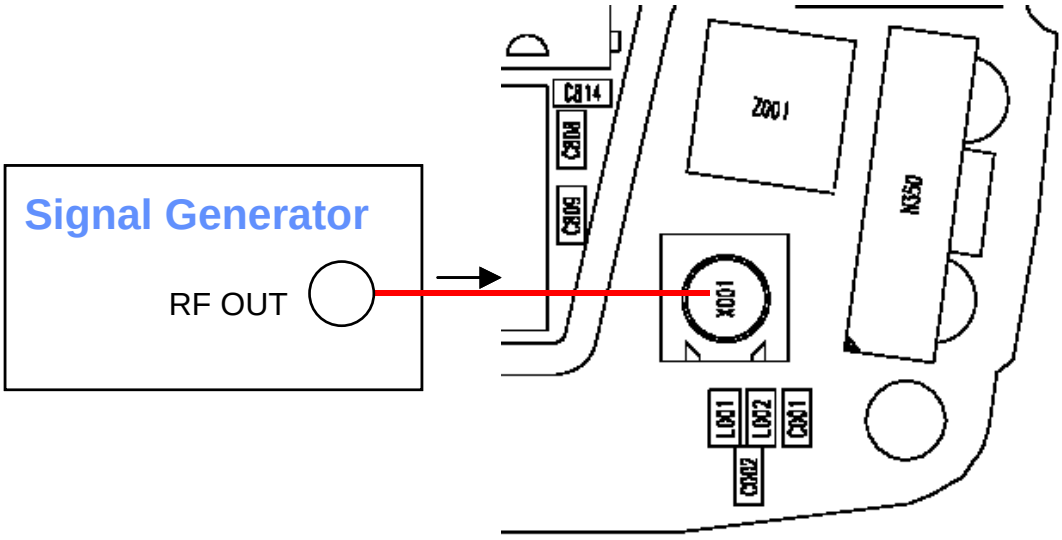
GPS RF Probing Setup

1 Turn on the GPS Receiver



2 Inject -25dBm tone @ 1575.52MHz at GPS Connector (X001) with signal generator or Call Box.



3 Continue to the GPS RF Probing Diagram diagram which follows, and measure probe points with either a FET probe and a spectrum analyzer set at center frequency 1575.25MHz, Span = 500kHz, or a voltmeter as specified.

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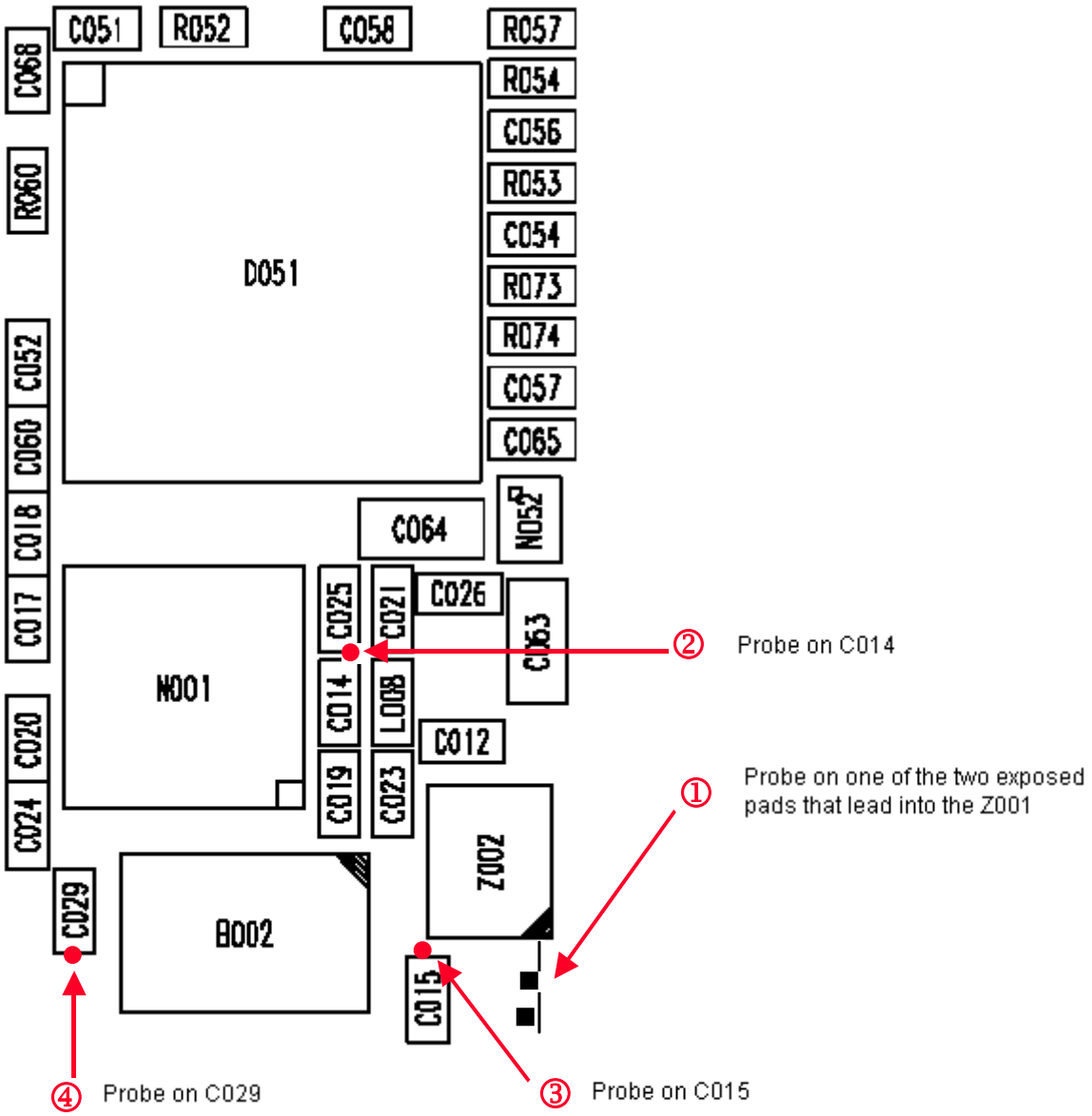
GPS RF Probing Measurements



PT	Description	Value	Instrument
①	LNA output	1575.25MHz @ -19.5dBm	spectrum analyzer
②	2nd BPF output	1575.25MHz @ -21dBm	spectrum analyzer
③	TXCO supply V_{RF_GPS}	2.78V (DC)	voltmeter
④	TXCO output freq	16.368MHz @ +6dBm	spectrum analyzer

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